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Langley Research Center



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Design of Microstrip Components by Computer

The problem:

To synthesize and design microstrip components with a computer.

The solution:

The task was accomplished by developing a system of programs that would handle the necessary types of component design problems.

How it's done:

The system is essentially divided into two areas: component analysis and design aids. The microstrip analysis was divided into single strip components, including low pass filters, lumped high pass filters, microstrip stopband filters, stepped impedance transformers, hybrid rings and finite circulators, and coupled microstrip lines, including end and parallel coupled bandpass filters, microstrip directional couplers, and hybrid T synthesis. The design aids include Chebyshev response, Spurious Intermodulation Products, analysis/optimization, diode characteristics and analysis, input/output and idler circuits, and microstrip triplers.

This system presents a number of computer programs used in the synthesis of microwave components with microstrip geometries. The programs accept component design requirements in terms of ordinary engineering data and, in return, compute the parameters needed to synthesize the component, either in terms of actual

physical dimensions or in terms of parameters, which can be reduced to physical dimensions through the use of other analysis or synthesis programs.

The system includes designs for couplers, filters, circulators, transformers, power splitters, diode switches, multipliers, diode phase shifters, and attenuators. Additional programs are included to analyze and optimize cascades of lumped elements and transmission line elements, to analyze and synthesize Chebyshev and Butterworth filter prototypes, and to compute mixer intermodulation products.

Notes:

1. This program was written in FORTRAN IV for use on a CDC-6600 computer.
2. Inquiries concerning this program should be directed to:

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